Cisco Catalyst **3750** Series Switches

Product Overview

Q. What are the Cisco® Catalyst® 3750 Switches?

A. The Cisco Catalyst 3750 Series switches are a premier line of enterprise-class, stackable, multilayer switches that provide high availability, security, and quality of service (QoS) to enhance the operation of the network. Its innovative unified stack management raises the bar in stack management, redundancy, and failover.

With a range of Fast Ethernet and Gigabit Ethernet configurations, the Cisco Catalyst 3750 Series can serve as both a powerful access layer switch for medium enterprise wiring closets and as a backbone switch for mid-sized networks. Customers can deploy networkwide intelligent services, such as advanced QoS, rate-limiting, Cisco security access control lists (ACLs), multicast management, and high-performance IP routing—while maintaining the simplicity of traditional LAN switching. Embedded in the Cisco Catalyst 3750 Series is the Cisco Cluster Management Suite (CMS) Software, which allows users to simultaneously configure and troubleshoot multiple Cisco Catalyst desktop switches using a standard Web browser.

Cisco CMS Software provides new configuration wizards that greatly simplify the implementation of converged applications and networkwide services.

Table 1 shows the complete list of Cisco Catalyst 3750 Series Intelligent Ethernet Switches.

Table 1 Cisco Catalyst 3750 Series Switches

Product Name	Part Number	Description
Cisco Catalyst 3750-48	WS-C3750-48TS-E	• 48 10/100 ports + 4 SFP-based Gigabit Ethernet ports • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 rack unit (RU) stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • Enhanced Multilayer Software Image (EMI) installed • Provides full dynamic IP routing

Table 1   Cisco Catalyst 3750 Series Switches

Product Name	Part Number	Description
Cisco Catalyst 3750-48	WS-C3750-48TS-S	• 48 10/100 ports + 4 SFPs • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 RU stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • Standard Multilayer Software Image (SMI) installed • SMI provides basic RIP and static routing, upgradable to full dynamic IP routing
Cisco Catalyst 3750-24	WS-C3750-24TS-E	• 24 10/100 ports + 2 SFP-based Gigabit Ethernet ports • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 RU stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • EMI installed • Provides full dynamic IP routing
Cisco Catalyst 3750-24	WS-C3750-24TS-S	• 24 10/100 ports + 2 SFP-based Gigabit Ethernet ports • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 RU stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • SMI installed • SMI provides basic RIP and static routing, upgradable to full dynamic IP routing
Cisco Catalyst 3750G-24TS	WS-C3750G-24TS-E	• 24 10/100/1000 ports • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 RU stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • EMI installed • Provides full dynamic IP routing
Cisco Catalyst 3750G-24TS	WS-C3750G-24TS-S	• 24 10/100/1000 ports • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 RU stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • SMI installed • SMI provides basic RIP and static routing, upgradable to full dynamic IP routing

Table 1 Cisco Catalyst 3750 Series Switches

Product Name	Part Number	Description
Cisco Catalyst 3750G-24T	WS-C3750G-24T-E	• 24 10/100/1000 ports • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 RU stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • EMI installed • Provides full dynamic IP routing
Cisco Catalyst 3750G-24T	WS-C3750G-24T-S	• 24 10/100/1000 ports • 32-Gbps, high-speed stacking bus • Innovative stacking technology • 1 RU stackable multilayer switch • Delivers enterprise-class intelligent services to the network edge • SMI installed • SMI provides basic RIP and static routing, upgradable to full dynamic IP routing

Q. What software images do the Cisco Catalyst 3750 switches support?

A. The Cisco Catalyst switches are available with the SMI or the EMI.

The Enhanced Multilayer Software Image enables a richer set of enterprise-class features, including hardware-based IP unicast and multicast routing, inter-VLAN routing, router access control lists (RACLs), and the Hot Standby Router Protocol (HSRP). Flexibility to upgrade to EMI after the initial deployment is provided through an EMI upgrade kit. Additional details about the differences between the SMI and EMI are provided later in this document.

Q. Can I enable static IP routing using the SMI?

A. Yes, RIP and static routing are supported on the SMI. Dynamic IP routing protocols (OSPF, BGPv4, EIGRP, IGRP) are available only on the EMI.

Q. Is the EMI required to allow Layer 3 and Layer 4 lookups for QoS and security?

A. No. Both the SMI and the EMI allow for Layer 3 and Layer 4 lookups for QoS and security.

Q. Do the Cisco Catalyst 3750 switches support Inter-Switch Link (ISL) virtual LAN (VLAN) trunking?

A. Yes, the Cisco Catalyst 3750 switches support both 802.1Q trunking and ISL trunking. VLAN trunks can be created from any port using either standards-based 802.1Q tagging or the Cisco ISL VLAN architecture.

Q. Can the Cisco Catalyst 3750 Series switches stack with the Cisco Catalyst 3550 Series switches?

A. No, the Cisco Catalyst 3750 switches cannot stack with the Cisco Catalyst 3550 switches. The Cisco Catalyst 3750 switches' new innovative Cisco StackWise™ technology with 32-Gbps high-speed stacking bus is not compatible with Cisco Catalyst 3550 switches' GigaStack® stacking.

Technology Overview

Q. What is Cisco StackWise technology?

A. The Cisco StackWise technology provides an innovative method for collectively using and extending the resources of a stack of units. Up to nine switches can be joined together to create a single switching unit with a virtual 32-Gbps stack interconnect. Furthermore, the entire stack can be managed as one unit with a single IP address. To the rest of the network, the stack operates as a single switch. With a unified management interface, the customer can with one command load a single image to all compatible switches on the stack. Cisco StackWise technology is optimized for Gigabit Ethernet deployment bringing customers new levels of performance through the high speed interconnect, resiliency through advanced failover mechanisms and ease of use through automated configuration and a single management interface.

Because of the Cisco StackWise technology, the Cisco Catalyst 3750 Series is highly scalable. There can be up to 252 Gigabit Ethernet ports in a stack. Switches within the stack can be added and removed without affecting user network access. New devices get the global configuration from the stack master, and replacement devices get the exact configuration of the old device. There is one configuration file with all stack member configurations.

Its innovative design sets the bar of availability in stackable switches. It supports link and switch level redundancy. The Cisco Catalyst 3750 supports cross-stack EtherChannel® as well as Cross-Stack UplinkFast (with subsecond failover), and cross-stack equal cost routes across different switches in the stack. These features eliminate the need of relying on HSRP for router failures. In the case of Master switch failure, another Master switch takes over with minimal disruption within 2 to 3 seconds.

For more information about Cisco StackWise technology, go to:

http://www.cisco.com/go/catalyst3750.

Q. What are Small Form-Factor Pluggables (SFPs)?

A. SFPs are transceivers that provide Gigabit Ethernet connectivity from the Cisco Catalyst 3750 switches to distribution layer switches. They are functionally equivalent to Gigabit Interface Converters (GBICs), but are much smaller.

Q. What SFPs are supported on Cisco Catalyst 3750 switches?

A. Cisco Catalyst 3750 switches support 1000BASE-LX/LH and 1000BASE-SX SFPs.

Q. Do the Cisco Catalyst 3750 switches interoperate with SFPs from other vendors?

A. No, like other Cisco switches and routers, the Cisco Catalyst 3750 switches do not interoperate with other vendors' SFPs. The switch will shut down the port if an SFP is inserted that is not a Cisco SFP.

Q. Is there a limit to the number of SFPs that can be used on a Cisco Catalyst 3750 Switch?

A. No. Users can populate all the SFP ports of any Cisco Catalyst 3750 Switch with the same SFP or with a combination of different SFPs. Cisco Catalyst 3750 switches support the following Cisco SFPs: 1000BASE-SX and 1000BASE-LX/LH.

Q. Do the Cisco Catalyst 3750 switches have Redundant Power Supply (RPS) support?

A. Yes. The Cisco Catalyst 3750 switches can be supported by the Cisco RPS 675 and the Cisco RPS 300. Both the Cisco RPS 675 and RPS 300 provide superior internal power source redundancy for up to six Cisco networking devices. This results in improved fault tolerance and network uptime. For more information go to:

http://www.cisco.com/en/US/products/hw/accessor/ps2883/products_data_sheet09186a0080150e31.html.

Q. What is the difference between Cisco Redundant Power Supply 675 (RPS 675) and RPS 300?

A. The Cisco RPS 675 is the next-generation of the RPS 300. It provides more power (675W) than RPS 300 (300W). RPS 675 can provide up to 375W of –48V power, and 300W of 12V power. Unlike the Cisco RPS 300, the RPS 675 comes up in active mode. The customer does not need to push a button to activate the RPS 675 after a power failure.

Q. Does it cost more for a Layer 3 or special-features license?

A. The Cisco Catalyst 3750-24TS-E, 3750-48TS-E, 3750G-24T-E, 3750G-24TS-E are loaded with the Enhanced Multilayer Software Image, so all feature license fees are part of the standard list price. However, the Cisco Catalyst 3750-24TS-S, 3750-48TS-S, 3750G-24T-S, 3750G-24TS-S switches are loaded with the Standard Multilayer Software Image; these switches can be upgraded to the Enhanced Multilayer Software Image with the purchase of the Enhanced Multilayer Software Image upgrade kit (part number CD-3750-EMI=). The Standard Multilayer Software Image includes RIP and static routing. For dynamic IP routing features (BGPv4, OSFP, EIGRP, IGRP), the EMI is required.

Q. What features are only supported on the EMI?

A. The following features and functionality are supported with the Enhanced Multilayer Software Image:

- Dynamic IP routing protocols for load balancing and constructing scalable LANs:
    - Open Shortest Path First (OSPF)
    - Interior Gateway Routing Protocol (IGRP) and Enhanced IGRP (EIGRP)
    - Border Gateway Protocol (BGPv4)
- Equal-cost routing for load balancing and redundancy
- Cisco standard and extended IP security Router RACLs for defining security policies on routed interfaces for control plane and data plane traffic
- Fallback bridging for forwarding of non-IP traffic between two or more VLANs
- Cisco Hot Standby Router Protocol (HSRP) to create redundant failsafe routing topologies
- Protocol-Independent Multicast (PIM) for IP multicast routing within a network that enables the network to receive the multicast feed requested and for switches not participating in the multicast to be pruned—support for PIM sparse mode (PIM-SM), PIM dense mode (PIM-DM), and PIM sparse-dense mode
- Distance Vector Multicast Routing Protocol (DVMRP) tunneling for interconnecting two multicast-enabled networks across nonmulticast networks
- Policy-based Routing (PBR) allows superior control by enabling flow redirection regardless of the routing protocol configured

Intelligent Switching

Q. Why do I need intelligence at the edge of my network?

A. Networks are evolving to address four new developments at the network edge:

- Increase in desktop computing power
- Introduction of bandwidth-intensive applications
- Expansion of highly sensitive data on the network
- Presence of multiple device types, such as IP phones and wireless LAN access points

These new demands are contending for resources with many existing mission-critical applications. As a result, IT professionals must view the edge of the network as critical to effectively manage the delivery of information and applications. As companies increasingly rely on networks as the strategic business infrastructure, it is more important than ever to ensure their high availability, security, scalability, and control. By adding Cisco intelligent functions to the wiring closet, customers can now deploy networkwide intelligent services that address these requirements in a consistent way from the desktop to the core and through the WAN.

With Cisco Catalyst Intelligent Ethernet switches, Cisco helps companies to realize the full benefits of adding intelligent services to their networks. Deploying capabilities that make the network infrastructure highly available to accommodate time-critical needs, scalable to accommodate growth, secure enough to protect confidential information, and capable of differentiating and controlling traffic flows are key to further optimizing network operations.

Q. Can you provide more details on how Cisco intelligent switching will help my network?

A. New applications are requiring higher bandwidth and the need to differentiate and control the traffic flow. Applications such as enterprise resource planning (ERP) (Oracle, SAP, etc.), voice (IP telephony traffic) and CAD/CAM require prioritization over less time-sensitive applications such as FTP or Simple Mail Transfer Protocol (SMTP). It would be highly undesirable to have a large file download destined to one port on a wiring closet switch and have quality implications such as increased latency in voice traffic, destined to another port on this switch. This condition is avoided by ensuring that voice traffic is properly classified and prioritized throughout the network. Cisco Intelligent Ethernet switches implement superior QoS to ensure that network traffic is classified, prioritized, and congestion is avoided.

Security

Q. How will the security needs of a network be handled?

A. With the rise in internal threats to a network, Cisco Ethernet switches enhance data security through a wide range of features including Secure Shell (SSH) and Simple Network Management Protocol version 3 (SNMPv3) protocols, ACLs, 802.1x, port security, private VLAN edge, Dynamic Host Configuration Protocol (DHCP) interface tracker, MAC address notification, and RADIUS/TACACS+. Depending on your security needs, the Cisco Catalyst 3550 Series complements devices such as firewalls, VPNs, and Intrusion Detection Systems.

Q. For security purposes, how can I protect unauthorized users from accessing my network?

A. The Cisco Catalyst 3750 supports 802.1x that works in conjunction with a RADIUS server to authenticate users as they access a network. The 802.1x standard is considered port-level security and is commonly used for wireless LANs. Additionally, portions of the network can be restricted by using ACLs. Access can be denied based on Media

Access Control (MAC) addresses, IP addresses, or Transmission Control Protocol (TCP)/User Datagram Protocol (UDP) ports. ACL lookups are done in hardware—forwarding and routing performance is not compromised when implementing ACL-based security. An additional protection method is to use port security, which ensures the appropriate user is on the network by limiting access to the port based on MAC addresses.

Q. For security purposes, how can I monitor or track activities in my network?

A. Intrusion detection systems are tailored to monitor and track activities in a network. The Cisco Catalyst 3750 can complement this through features such as MAC address notification, which will send an alert to a management station so that network administrators know when and where users came on to the network and can take appropriate actions. The DHCP Interface Tracker (Option 82) feature will track where a user is physically connected on a network by providing both switch and port ID to a DHCP server.

Q. For security purposes, how do I protect administration passwords and traffic going to the switch during configuration or troubleshooting?

A. To protect administration traffic during the configuration or troubleshooting of a switch (such as passwords or device configuration settings), the best approach is to encrypt the data. Both SSH and SNMPv3 provide encryption of data during Telnet sessions and SNMP sessions.

Network Management

Q. Do the Cisco Catalyst 3750 switches support Cisco Switch Clustering technology?

A. Yes, the Cisco Catalyst 3750 switches can be managed using the Web-based Cisco Cluster Management Suite (CMS) Software, which uses Cisco Switch Clustering technology. Cisco CMS is Web-based software that is embedded in Cisco Catalyst 3750, 3550, 2950, 3500 XL, 2900 XL, 2900 LRE XL, and 1900 switches. Through Cisco Switch Clustering technology, users access Cisco CMS with any standard Web browser to manage up to 16 of these switches at once, regardless of their geographic proximity with the option of using a single IP address if desired. With the addition of the Cisco Catalyst 3750 switches, Cisco CMS can now extend beyond routed boundaries for even more flexibility in managing a Cisco cluster.

Cisco CMS provides an integrated management interface for delivering intelligent services, enabling users to manage their entire LAN with one robust tool. By bringing the simplicity of traditional LAN switching to intelligent services such as multilayer switching, QoS, multicast, and security ACLs, Cisco CMS allows administrators to take advantage of benefits formerly reserved for only the most complex networks. The new Guide Mode in Cisco CMS leads the user step by step through the configuration of high-end features and provides enhanced online help for context-sensitive assistance. In addition, a Solution Wizard provides automated configuration of the switch for video streaming or videoconferencing. Future software will provide Solution Wizards for voice over IP (VoIP), mission-critical applications, and security.

Cisco CMS supports standards-based connectivity options such as Ethernet, Fast Ethernet, Fast EtherChannel®, Gigabit Ethernet, and Gigabit EtherChannel connectivity. Because Cisco Switch Clustering technology is not limited by proprietary stacking modules, stacking cables or interconnection media, Cisco CMS expands the traditional cluster domain beyond a single wiring closet and lets users mix and match interconnections to meet specific management, performance, and cost requirements.

Cisco Catalyst 3750 switches can be configured either as command or member switches in a Cisco switch cluster. Cisco CMS also allows the network administrator to designate a standby or redundant command switch, which takes the commander duties should the primary command switch fail. Other important features include the ability to configure multiple ports and switches simultaneously, as well as perform software updates across the entire cluster at once. Bandwidth graphs and link reports provide useful diagnostic information and the topology map gives network administrators a quick view of the network status.

Positioning

Q. When would I deploy a Cisco Catalyst 3750 Series versus a Cisco Catalyst 3550 Series switch?

A. The Cisco Catalyst 3750 switches are designed for deployment in similar topological positions in the network as the Cisco Catalyst 3550 switches. These positions include in the access layer and network backbone of enterprise wiring closets and branch office networks. The Cisco Catalyst 3750 switches are ideal for those networks requiring higher levels of availability, redundancy, and performance, and offer the next level of ease of stack management. The Cisco Catalyst 3750 also provides a higher performance stack interconnect with Cisco StackWise Technology.

Q. What is the positioning of the Cisco Catalyst 3750 Series switches relative to the Cisco Catalyst 2950 Series switches?

A. The Cisco Catalyst 3750 switches and the Cisco Catalyst 2950G switches are capable of delivering intelligent services such as advanced QoS, rate-limiting, security filtering, and multicast management to the network edge. The Cisco Catalyst 3750 switches are the premium fixed-configuration switches and offer greater product family breadth, a richer set of enterprise-class features, and a platform that supports dynamic, hardware-based IP routing, and the next generation of stack management and has a much higher performance stack interconnect.

Q. Can CMS manage the Cisco Catalyst 3750 switches with other desktop switches?

A. All desktop switching platforms including the Cisco Catalyst 3750, 3550, 2950, 2950-LRE, 3500 XL, 2900 XL, 2900 LRE XL, and 1900 can be managed using the Cisco CMS Software.

Q. How is Cisco StackWise technology different from GigaStack?

A. GigaStack is a 1 Gbps stacking mechanism that allows traffic to pass between individual switches. Cisco StackWise technology is a 32-Gbps stack interconnect that unites all of the switches in a stack into one logical unit for switching and routing.

Service and Warranty

Q. What is the warranty for the Cisco Catalyst 3750 Series Switches?

A. Cisco Catalyst 3750 switches come with the Cisco Limited Lifetime Hardware Warranty. Ongoing software updates are available to customers on the Cisco Web site free of charge.

Limited Lifetime Warranty

The hardware warranty available on Cisco Catalyst 3750, 3550, 2950, and 3500 XL is the Limited Lifetime Hardware Warranty. This warranty automatically comes with the purchase of eligible Cisco Catalyst products, free of charge. For specific details on the Limited Lifetime Hardware Warranty visit:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/lh2cen__.htm

Software Updates

In addition to the Limited Lifetime Hardware Warranty, Cisco is offering ongoing Cisco IOS® Software updates on LAN access switches free of charge for these platforms. For the life of the product, updates within the release and feature set purchased will be made available to customers through the Software Center at:

http://www.cisco.com/public/sw-center/sw-switching.shtml.

Ongoing software updates will be available for the Cisco Catalyst 3750 Series. Updates are applicable only for releases that Cisco makes available. This statement supersedes any previous warranty or software statement and is subject to change without notice.

Q. What types of service and support are available for the Cisco Catalyst 3750 Series switches?

A. A full complement of life-cycle service and support is available for the Cisco Catalyst 3750 Series. From implementation to operation and optimization, Cisco offers Technical Support Service and Advanced Service delivered either directly or through one of its best-in-class partners.

Technical Support Service

Technical Support Service is available through SMARTnet® and SMARTnet Onsite. SMARTnet augments the resources of your operations staff by providing them with access to expertise, both online and on the telephone, and a range of hardware Advance Replacement options. SMARTnet Onsite complements the hardware Advance Replacement feature by adding the services of a field engineer, services that can be critical for those locations where staffing is insufficient or unavailable to perform parts replacement activities. For more information about SMARTnet, visit:

http://www.cisco.com/warp/public/cc/serv/mkt/sup/ent/snet/.

Advanced Service

Total Implementation Solutions (TIS) offers a full range of implementation solutions including project management, project engineering, configuration, staging, and rollout coordination, and ensuring correct installation and deployment. Configuration services now include development and verification of configuration for intelligent services such as QoS and multicast. For more information about Total Implementation Solutions, visit:

http://www.cisco.com/warp/public/cc/serv/mkt/sup/ent/tis/.

For more information about configuration services for QoS and multicast, contact gps-pds-west@cisco.com.

Product and Contact Information

Q. Where can I find technical and product specifications and other additional information about the Cisco Catalyst 3750 switches?

A. For product literature including data sheets and product specifications, see the Cisco Catalyst 3750 Web site at:

http://www.cisco.com/go/catalyst3750.

Q. What are the part numbers for the Cisco Catalyst 3750 switches? When does it become orderable?

A. The part number and orderability information for the new Cisco Catalyst 3750 switches is available at:

http://www.cisco.com/go/catalyst3750.

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